

Appl. #08/484,594

Filed: 6/7/95

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Case Docket No.: MYELOS.002DV2

*Int. Soc. Neurochem.
Boston, 1997***AMELIORATION OF SPATIAL LEARNING IMPAIRMENT AND NEURONAL LOSS IN RATS WITH STAB WOUNDS BY PROSAPOSIN****Hozumi, I.¹, Hiraiwa, M.³, Yoneoka, U.², Inuzaka, T.¹, Tsuji, S.¹, Akiyama, K.², Tanaka, R.², and O'Brien, J.S.³**¹Dept. Neurol, ²Dept. Neurosurg., Brain Res. Inst., Univ. Niigata, Niigata, 951 JAPAN., ³Dept. Neurosci., Univ. Calif. San Diego, La Jolla, CA 92093-0634, U.S.A.

Prosaposin, the precursors of four saposins which activate sphingolipid hydrolases, has been identified as a neurotrophic factor. We have investigated the effect of prosaposin using rats with bilateral stab wounds in the cortices and hippocampi by Morris water maze task and histological examinations. We injected 240 ng of prosaposin into the stab wounds for 3 days postoperation. After 3 weeks postoperation, the mean number of crossings of the platform place in the transfer test in the water maze task was $3.58\bar{A}\pm 1.92$ in stab-wounded rats treated with PBS (n=19), $5.43\bar{A}\pm 1.40$ in stab-wounds rats treated with prosaposin (n=7) and $6.00\bar{A}\pm 1.91$ in sham-operated rats (n=19), respectively. The cavities following stab wounds were smaller and the loss of neurons around stab wounds were smaller in number in the rats treated with prosaposin than those in the rats treated with PBS. The stab-wounds rats treated with prosaposin showed significant improvement not only in spatial learning impairment but also in histological examinations. Effectiveness of prosaposin has been reported for brain ischemia previously. Our study demonstrated that prosaposin is effective for brain injury. These results raise the possibility that prosaposin may be effective for preventing neuronal cell death in neurodegenerative diseases and brain injury.